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PROBLEMS FOR SOLUTION.

ALGEBRA.

298. Proposed by J. F. LAWRENCE, A. B., Professor of Mathematics, Stillwater, Okla.

If $\alpha, \beta, \gamma, \dots$, are the roots of the equation $\sin mx - nx \cos mx = 0$, prove that $\tan^{-1} \frac{x}{\alpha} + \tan^{-1} \frac{x}{\beta} + \dots + \tan^{-1} \frac{x}{\gamma} = 0$.

GEOMETRY.

331. Proposed by DAVID F. KELLEY, New York, N. Y.

To find the area of a parabolic sector, by a hitherto unpublished method.

CALCULUS.

255. Proposed by A. H. HOLMES, Brunswick, Maine.

Evaluate $\int_0^a \frac{dx}{\sqrt{[2ax - x^2] \sqrt{(a^2 - x^2)}}}$.

256. Proposed by PROFESSOR R. D. CARMICHAEL, Anniston, Ala.

Solve the differential equation, $(1 + y + 2xy) dx + x(1 + x) dy = 0$.

MECHANICS.

215. Proposed by HENRY WRITT, Genoa Junction, Wisconsin.

Suppose two centers of attractive forces A and B having a ratio $1 : 330,000$, and influence reducing as the second power of the distance, *i. e.*, R^{-2} . Then there is a point, P , on the line joining A and B , where $\frac{1}{AP^2} = \frac{330,000}{BP^2}$, or $1 : 575$, nearly. At this point the attractions are equal but opposite in direction along AB . It is proposed to find the surface through the point P which is the locus of the direction of the resultant of the two forces directed towards A and B , *i. e.*, the locus of the diagonals of the minimum parallelogram of forces.